

## **Characterization of an Advanced Technology CCD for the Cassini Stellar Reference Unit**

### **Authors:**

**Randel Blue**

Jet Propulsion Laboratory  
California Institute of Technology  
4800 oak Grove Drive MS 198-235  
Pasadena, Ca. 91109  
Telephone (818) 354-9795  
Fax (818) 393-6105

**Patrick Waddell**

Jet Propulsion Laboratory  
California Institute of Technology  
4800 Oak Grove Drive MS 198-235  
Pasadena, Ca. 91109  
Telephone (818) 354-0783  
Fax (818) 393-6105

Submit to: Space Guidance, Control, and Tracking (Morris Birnbaum)  
at Orlando '94

### **Abstract:**

The Cassini mission to Saturn will rely on a CCD based star tracker known as the Stellar Reference Unit. The SRU is designed with an advanced technology Loral 1024x1024 pixel CCD that incorporates multi-pinned phase (MPP) technology. MPP allows the vertical array clocks of the CCD to be held in an inverted state during exposure. This provides for a substantial decrease in dark current while still retaining a wide dynamic range. The effects that this MPP mode CCD has on the operation of a star tracker, with particular emphasis on the implications for the Cassini SRU, are discussed. A description of the characterization procedures used for the CCD both in a test laboratory and at JPL's Table Mountain Observatory are included.

### **Biography:**

**Randel Blue**

As a member of the Optical Tracking Group in the Guidance and Control section at JPL, Mr. Blue has designed and developed numerous optical sensor systems for metrology applications. Examples include CCD-based star trackers for spacecraft attitude determination, multi-target ranging sensors, fiber optic interferometers and position sensors for robotic control. Mr. Blue has a Bachelor of Science in Electrical Engineering from the University of Texas at Austin and a Master of Science in Electrical

Engineering from the University of Southern California. His current assignment at JPL includes development of the Stellar Reference Unit for the Cassini mission.